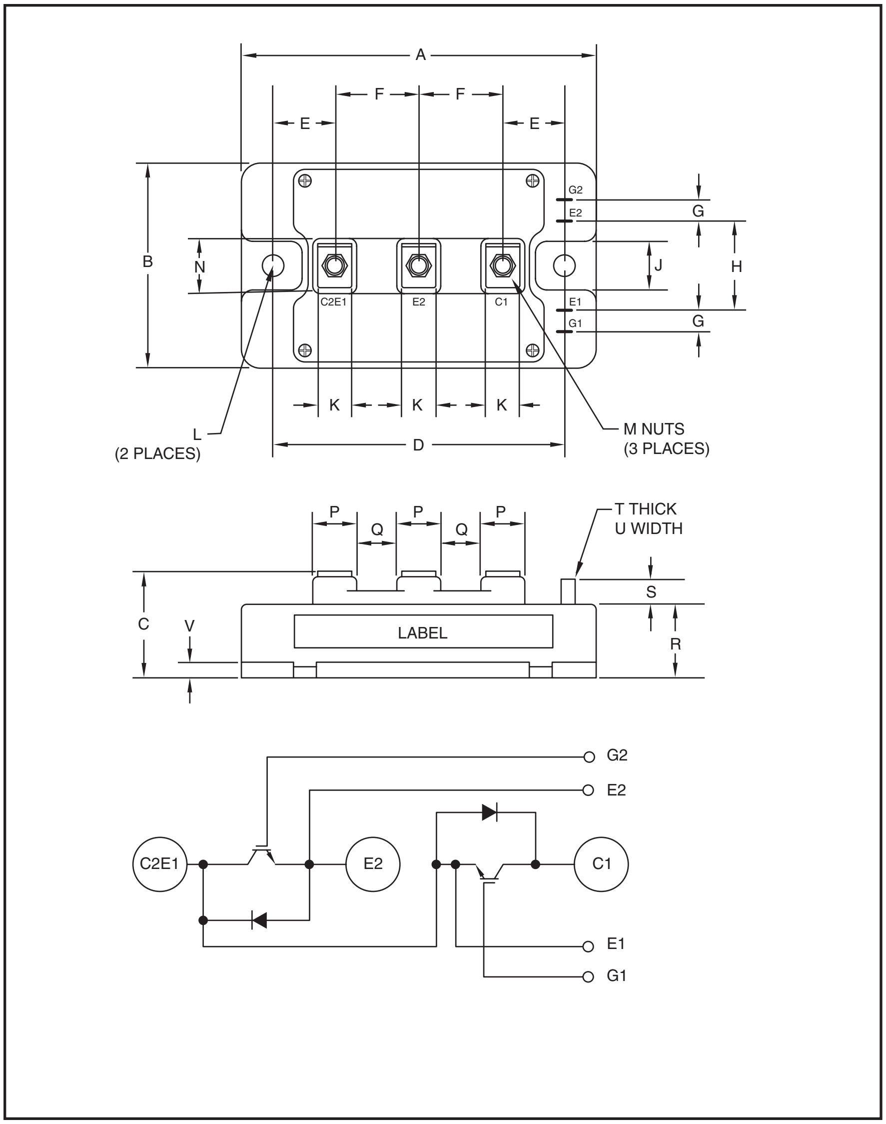
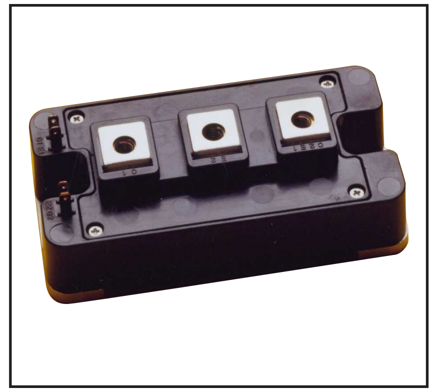
Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

Dual IGBTMOD™
A-Series Module
100 Amperes/1700 Volts



Outline Drawing and Circuit Diagram



Dimensions	Inches	Millimeters
A	3.70	94.0
B	1.89	48.0
C	1.14+0.04/-0.02	29.0+1.0/-0.5
D	3.15±0.01	80.0±0.25
E	0.67	17.0
F	0.91	23.0
G	0.16	4.0
H	0.71	18.0
J	0.51	13.0
K	0.47	12.0

Dimensions	Inches	Millimeters
L	0.26 Dia.	Dia. 6.5
M	M5 Metric	M5
N	0.79	20.0
P	0.63	16.0
Q	0.28	7.0
R	0.83	21.2
S	0.30	7.5
T	0.02	0.5
U	0.110	2.8
V	0.16	4.0

Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of two IGBT Transistors in a half-bridge configuration with each transistor having a reverse-connected super-fast recovery free-wheel diode. All components and interconnects are isolated from the heat sinking baseplate, offering simplified system assembly and thermal management.

Features:

- ☐ Low Drive Power
- ☐ Low $V_{CE(sat)}$
- ☐ Discrete Super-Fast Recovery Free-Wheel Diode
- ☐ Isolated Baseplate for Easy Heat Sinking

Applications:

- ☐ AC Motor Control
- ☐ UPS
- ☐ Battery Powered Supplies

Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM100DY-34A is a 1700V (V_{CES}), 100 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	100	34

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Absolute Maximum Ratings, T_j = 25°C unless otherwise specified

Ratings	Symbol	CM100DY-34A	Units
Junction Temperature	T_j	–40 to 150	°C
Storage Temperature	T_{stg}	–40 to 125	°C
Collector-Emitter Voltage (G-E Short)	V_{CES}	1700	Volts
Gate-Emitter Voltage (C-E Short)	V_{GES}	±20	Volts
Collector Current (DC, T_C = 108°C)*4	I_C	100	Amperes
Peak Collector Current (Pulse Repetition)*2	I_{CM}	200	Amperes
Maximum Collector Dissipation (T_C = 25°C, $T_j \leq$ 150°C)*2,*4	P_C	960	Watts
Emitter Current (T_C = 25°C)	I_E*1	100	Amperes
Peak Emitter Current (Pulse Repetition)*2	I_{EM}*1	200	Amperes
Mounting Torque, M5 Main Terminal	—	30	in-lb
Mounting Torque, M6 Mounting	—	40	in-lb
Weight	—	310	Grams
Isolation Voltage (Main Terminal to Baseplate, f = 60Hz, AC 1 min.)	V_{ISO}	3500	Volts

Static Electrical Characteristics, T_j = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	$V_{CE} = V_{CES}$, V_{GE} = 0V	—	—	1.0	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}$, V_{CE} = 0V	—	—	2.0	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	I_C = 10mA, V_{CE} = 10V	5.5	7.0	8.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V, T_j = 25°C*3	—	2.2	2.8	Volts
		I_C = 100A, V_{GE} = 15V, T_j = 125°C*3	—	2.45	—	Volts
Total Gate Charge	Q_G	V_{CC} = 1000V, I_C = 100A, V_{GE} = 15V	—	670	—	nC
Emitter-Collector Voltage	V_{EC}*1	I_E = 100A, V_{GE} = 0V*3	—	—	3.0	Volts

Dynamic Electrical Characteristics, T_j = 25°C unless otherwise specified

Characteristics		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance		C_{ies}		—	—	24.7	nf
Output Capacitance		C_{oes}	V_{CE} = 10V, V_{GE} = 0V	—	—	2.8	nf
Reverse Transfer Capacitance		C_{res}		—	—	0.53	nf
Inductive	Turn-on Delay Time	$t_{d(on)}$		—	—	200	ns
Load	Rise Time	t_r	V_{CC} = 1000V, I_C = 100A,	—	—	150	ns
Switch	Turn-off Delay Time	$t_{d(off)}$	$V_{GE1} = V_{GE2}$ = 15V, R_G = 4.8Ω,	—	—	550	ns
Time	Fall Time	t_f	Inductive Load	—	—	350	ns
Diode Reverse Recovery Time		t_{rr}*1	Switching Operation,	—	—	300	ns
Diode Reverse Recovery Charge		Q_{rr}*1	I_E = 100A	—	10	—	μC

*1 Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).
*2 Pulse width and repetition rate should be such that device junction temperature (T_j) does not exceed $T_{j(max)}$ rating.
*3 Pulse width and repetition rate should be such as to cause negligible temperature rise.
*4 Case temperature (T_C), and heatsink temperature (T_f) measured point is just under the chips.

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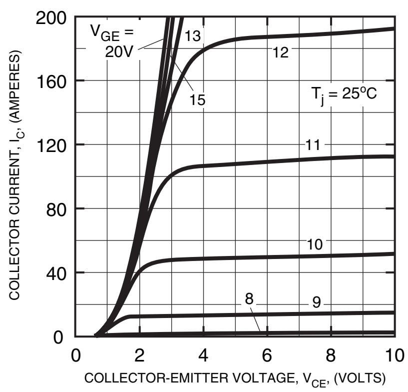
Thermal and Mechanical Characteristics, T_j = 25°C unless otherwise specified

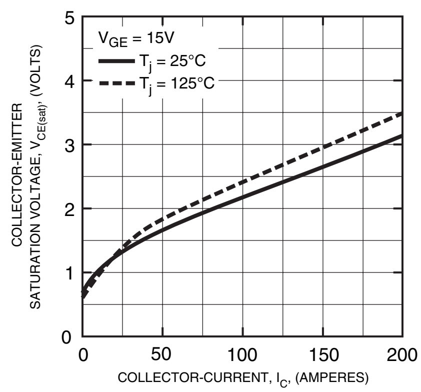
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}Q$	Per IGBT*4	—	—	0.13	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c)}D$	Per FWDi*4	—	—	0.21	°C/W
Contact Thermal Resistance	$R_{th(c-f)}$	Thermal Grease Applied*4,*5	—	—	—	°C/W
External Gate Resistance	R_G		4.8	—	48	Ω

*4 Case temperature (T_C), and heatsink temperature (T_f) measured point is just under the chips.
*5 Typical value is measured by using thermally conductive grease of λ = 0.9 [W/(m • K)].

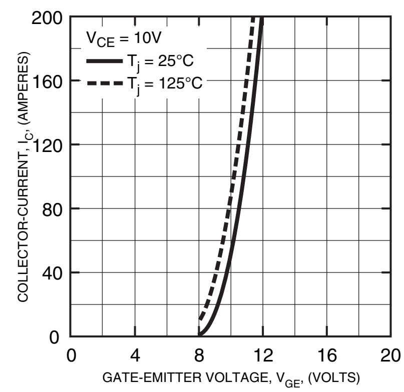
OUTPUT CHARACTERISTICS (TYPICAL)



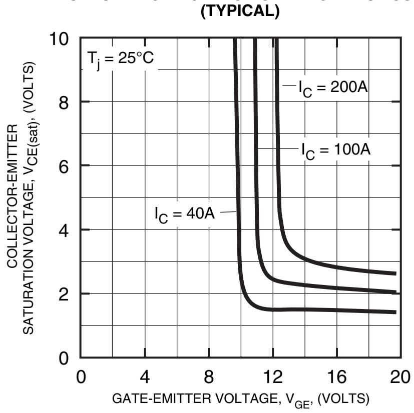
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



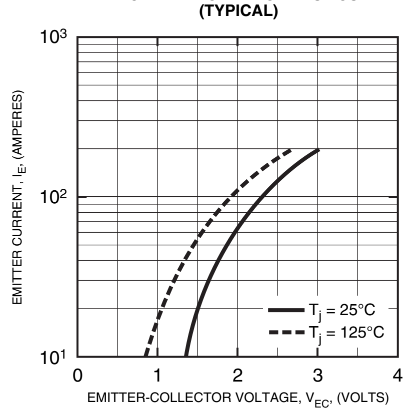
TRANSFER CHARACTERISTICS (TYPICAL)



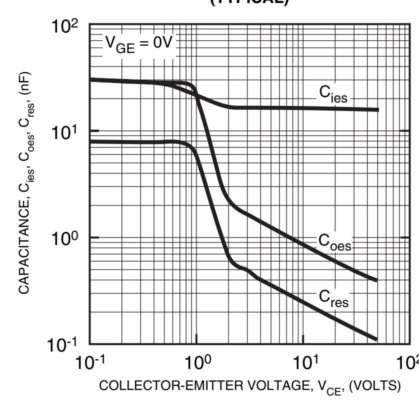
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



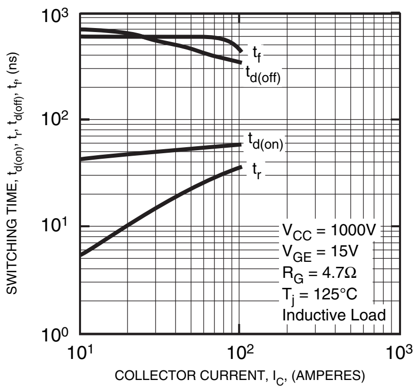
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



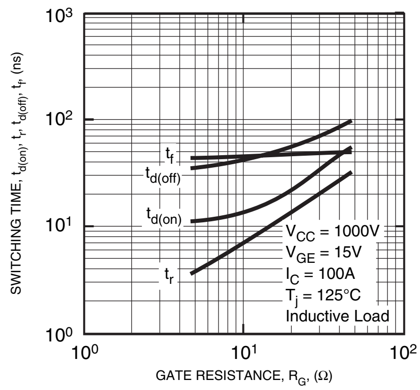
CAPACITANCE VS. V_{CE} (TYPICAL)



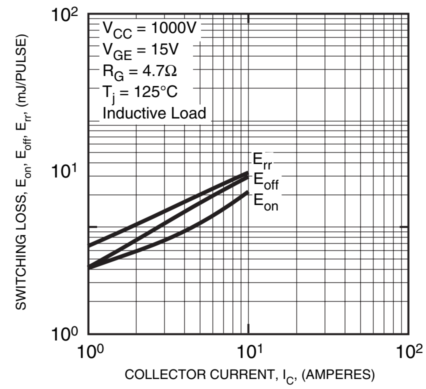
SWITCHING TIME VS. COLLECTOR CURRENT (TYPICAL)



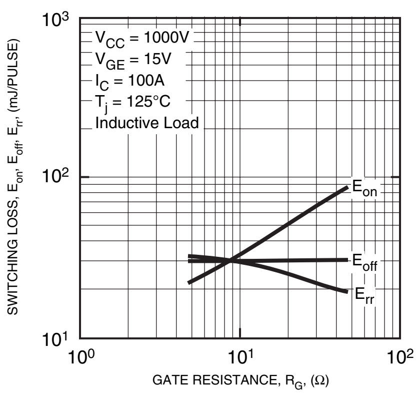
SWITCHING TIME VS. GATE RESISTANCE (TYPICAL)



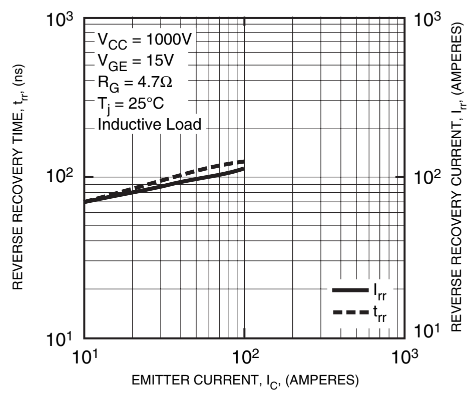
SWITCHING LOSS VS. COLLECTOR CURRENT (TYPICAL)



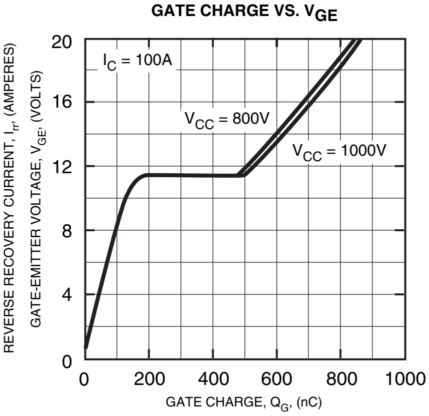
SWITCHING LOSS VS. GATE RESISTANCE (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



GATE CHARGE VS. V_{GE}



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT & FWDi)